	Pre-PTCA	Post-PTCA	p
Angiographic % diameter stenosis	63 ± 19	17 ± 11	<0.0001
Reference lumen area (mm^2)	9.8 ± 3.3		
Lesion EEM area (mm^2)	20.8 ± 6.7	24.4 ± 7.9	<0.0001
Stent area (mm^2)	7.4 ± 3.1	9.9 ± 3.7	<0.0001
Lesion lumen area (mm^2)	2.2 ± 1.2	6.7 ± 2.2	<0.0001
Lesion plaque area (mm^2)	18.6 ± 6.5	18.0 ± 6.7	NS
IH area within stent (mm^2)	5.3 ± 3.3	3.2 ± 2.5	<0.0001
% Area stenosis lumen vs reference	76.1 ± 14.0	31.0 ± 22.0	<0.0001
% Area stenosis stent vs reference	23.3 ± 26.9	−1.9 ± 33.1	<0.0001

Pre-intervention, 80% of lesions had a minimum stent area less than the reference lumen area, compared to 50% post-PTCA ($p = 0.0028$). Importantly, 55% of lumen enlargement after repeat PTCA was the result of additional stent expansion and 45% was the result of extrusion of tissue through the stent (decreased IH area within the stent). There was no evidence of compression of neointimal tissue post-PTCA (no change in overall plaque area). Dissections were uncommon (occurring in 17% of lesions after PTCA) and were minor in nature without clinical consequences. *We Conclude:* In-stent restenosis appears to be the result of inadequate primary stent expansion and superimposed neointimal hyperplasia. The mechanism of successful PTCA of in-stent restenosis is a combination of additional stent expansion (increased stent area) and neointimal tissue extrusion through the stent. PTCA of in-stent restenosis results in a relatively high residual stenosis (angiographic % diameter stenosis = 17 ± 11 and ultrasound % area stenosis = 31 ± 22); this may contribute to more frequent repeat episodes of restenosis.

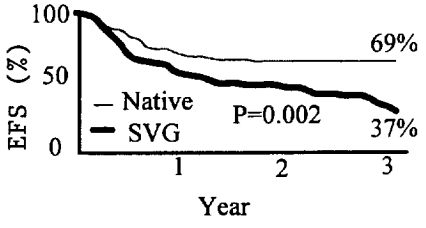
951-75 Comparative Analysis of Long Term Clinical Outcomes After Native Coronary versus Saphenous Vein Graft Stent Implantation

S. Chiu Wong, Ya Chien Chuang, Jeffrey J. Popma, Mun K. Hong, Augusto D. Pichard, Lowell F. Satler, Kenneth M. Kent, Theresa A. Bucher, Kathi Donovan, Kathy Morgan, Martin B. Leon. *Washington Hospital Center, Washington, DC*

To assess the late (3 years) clinical outcomes of JJIS stent (S) placement in the treatment of native coronary (NC) and saphenous vein graft (SVG) lesions, we compared baseline factors, procedural results and late clinical events in 112 pts (122 lesions) with native and 118 pts (153 lesions) with SVG lesions treated with S at the Washington Hospital Center. Pts with SVG lesions were older, had more frequent multivessel disease, history of prior MI, ostial and *denovo* lesions and lower ejection fractions (all $p < 0.005$). The initial and final % stenosis, procedural success and major complications (death, Q wave MI, CABG) were similar between the 2 groups.

Clinical events	Native 1/3 yr	SVG 1/3 yr	P value (log-rank)
Death (%)	0/1.5	8/22	0.0003
Q-wave MI (%)	1/1	5/8	0.06
TLR (%)	26/29	28/49	0.08
Non-TLR (%)	0/9	10/17	0.02

TLR = target lesion revascularization



(repeat PTCA or CABG) and EFS = event free survival (freedom from death, Q-wave MI, and TLR). During the first year after S placement, SVG lesions (compared with NC) had higher mortality and Q-wave MI, similar TLR and greater non-TLR events. Between 1 and 3 years, in SVG pts there was a further dramatic increase in mortality and TLR resulting in a 3-year actuarial EFS of only 37% (see figure). In contrast, NC behavior was stable between 1 and 3 years with no further mortality, Q-wave MI, or TLR, but a 10% incidence of non-TLR events. *In conclusion:* Despite similar procedural results, SVG vs native pts treated with S manifested disparate late clinical responses. Disturbingly, in SVG pts there was progressive mortality (in part due to increased pt morbidity) and additional TLR events after the first year of S implantation (ie. "late" restenosis) causing a striking attrition in 3 year EFS.

952 Cardiovascular Surgery

Tuesday, March 21, 1995, Noon–2:00 p.m.
Ernest N. Morial Convention Center, Hall E
Presentation Hour: 1:00 p.m.–2:00 p.m.

952-23 Use of the Elephant Trunk Technique in the Marfan Patient

Markus K. Heinemann, Beate Buehner, Michael J. Jurmann, Hans G. Borst. *Hannover Medical School, Hannover, Germany*

Patients afflicted with aortic manifestations of the Marfan syndrome often require staged aortic replacement. To facilitate anastomosing of the aorta further downstream, the "elephant trunk technique", which leaves surplus intravascular graft length, was applied.

Between 1982 and 1994, 18 elephant trunks were implanted in 14 patients with the Marfan syndrome (age range 20–50 years) suffering from chronic aortic dissection: type A = 9 (7 s/p emergency repair in the acute stage), type B = 5. In 5 patients, the primary elephant trunk was placed "proximally", meaning the extension of a total aortic arch replacement into the proximal descending thoracic aorta. It was left "distally", extending from a grafted descending aorta into the thoraco-abdominal portion, in 9 patients. Subsequent downstream replacement was performed after a mean interval of 9 months: descending thoracic aortic replacement, again utilizing an elephant trunk, in 4 cases, thoraco-abdominal replacement in 5. Two patients underwent additional abdominal grafting. Thus, a total of 32 aortic operations, involving 18 elephant trunks, was performed in 14 patients. There was no mortality associated with the elephant trunk technique. Over time, technical modifications were introduced to ease the unfolding of the trunk. Ample membrane resection avoids its entrapment in the false lumen of a dissected vessel.

In patients with the Marfan syndrome, who often need multiple aortic operations, the "elephant trunk technique" greatly disencumbers these troublesome procedures.

952-24 Role of Leukocyte Depletion During Cardioplegic Arrest

Harold L. Lazar, Xi Zhang, Takafumi Hamasaki, Patrick Treanor, Samuel Rivers, Richard J. Shemin. *Boston University Medical Center, Boston, MA*

Leukocyte depletion (LD) filters may be beneficial during reperfusion of acutely ischemic myocardium; however, its role during cardiopulmonary bypass (CPB) and blood cardioplegic (BCP) arrest is unknown. This study sought to determine whether inserting LD filters during CPB and BCP arrest decreased ischemic damage. In 20 pigs, the 2nd and 3rd diagonal vessels were occluded for 90 minutes followed by 45 minutes of BCP arrest and 180 minutes of reperfusion on CPB. In 5 pigs, LD filters were inserted both in the CPB and BCP circuits (CPB + BCP), 5 pigs had LD during BCP only (BCP), 5 pigs had LD during CPB only (CPB), and 5 pigs had no LD. Ischemic damage was assessed by Wall Motion Scores (WMS) using 2-D echo (4 = normal to −1 = dyskinesia) and the Area of Necrosis/Area of Risk (AN/AR). Results are Mean ± SE.

	No LD	BCP	CPB	CPB + BCP
WMS	1.7 ± 0.4	2.0 ± 0.2	3.6 ± 0.1*	3.4 ± 0.2*
AN/AR (%)	34 ± 2	29 ± 1	17 ± 1*	19 ± 1*

*$p < 0.05$ from no LD and BCP groups

We conclude that LD filters significantly reduce ischemic damage and are most effective when placed in the CPB circuit.

952-25 Carpentier Techniques for Mitral Valve Reconstruction: Experiences in 560 Patients Over 14 Years

Aubrey C. Galloway, Eugene A. Grossi, F. Gregory Baumann, Julie Delianides, Frank C. Spencer, Stephen B. Colvin. *New York University Medical Center, New York, NY*

Between 6/79 and 6/93 a total of 560 patients with mitral insufficiency had Carpentier type mitral valve reconstruction with ring annuloplasty. The primary etiology of mitral disease was degenerative in 46%, rheumatic in 21%, ischemic in 18% and other in 15%. Concomitant cardiac procedures were performed in 283 patients (51%). Hospital mortality was 5.9% (33/560) overall and 2.5% (7/277) for isolated mitral reconstruction. Multivariate analysis revealed that NYHA classification, age, and associated coronary disease were significant predictors of increased operative risk. Late clinical and echocardiographic follow-up (f/u) was 98% complete, with a mean f/u interval of 3.5 years (range 1 month–14 years; total f/u 1,977 patient-years). Actuarial freedom from complications at 5 and 10 years was as follows: thromboembolic = 93% & 86%, anticoagulant = 97% & 97%, endocarditis = 97%